

WHAT IS CLAIMED IS

1. A coating solution for use in forming Bi-based ferroelectric thin films that comprises an organometallic compound
5 containing the metallic elements of which a Bi-based ferroelectric thin film is composed, and a compound represented by the following general formula (I):



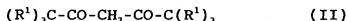
where n is an integer of 2 - 5.

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2. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 1, wherein said organometallic compound and the compound represented by said general formula (I) (where n is as defined in claim 1) have reacted with
15 each other to form a reaction product.

3. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 1, which is stabilized with at least one stabilizer selected from among carboxylic
20 anhydrides, dicarboxylic acid monoesters, β -diketones and glycols.

4. A coating solution for use in forming Bi-based ferroelectric thin films that comprises an organometallic compound containing the metallic elements of which a Bi-based ferroelectric
25 thin film is composed, and a compound represented by the following general formula (II):

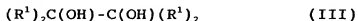


where R^1 is an alkyl group having 1 - 3 carbon atoms.

5. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 4, wherein said organometallic compound and the compound represented by said general formula (II) (where R¹ is as defined in claim 4) have reacted with each other to form a reaction product.

6. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 4, which is stabilized with at least one stabilizer selected from among carboxylic anhydrides, dicarboxylic acid monoesters, β-diketones and glycols.

7. A coating solution for use in forming Bi-based ferroelectric thin films that comprises an organometallic compound containing the metallic elements of which a Bi-based ferroelectric thin film is composed, and a compound represented by the following general formula (III):



where R¹ is an alkyl group having 1 - 3 carbon atoms.

8. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 7, wherein said organometallic compound and the compound represented by said general formula (III) (where R¹ is as defined in claim 7) have reacted with each other to form a reaction product.

9. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 7, which is stabilized with at least one stabilizer selected from among carboxylic

anhydrides, dicarboxylic acid monoesters, β -diketones and glycols.

10. A coating solution for use in forming Bi-based ferroelectric thin films that comprises an organometallic compound containing the metallic elements of which a Bi-based ferroelectric thin film is composed, and a compound represented by the following general formula (IV):

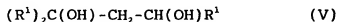


where R^1 is an alkyl group having 1 - 3 carbon atoms.

11. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 10, wherein said organometallic compound and the compound represented by said general formula (IV) (where R^1 is as defined in claim 10) have reacted with each other to form a reaction product.

12. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 10, which is stabilized with at least one stabilizer selected from among carboxylic anhydrides, dicarboxylic acid monoesters, β -diketones and glycols.

13. A coating solution for use in forming Bi-based ferroelectric thin films that comprises an organometallic compound containing the metallic elements of which a Bi-based ferroelectric thin film is composed, and a compound represented by the following general formula (V):



where R^1 is an alkyl group having 1 - 3 carbon atoms.

14. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 13, wherein said organometallic compound and the compound represented by said general formula (V) (where R¹ is as defined in claim 13) have reacted
5 with each other to form a reaction product.

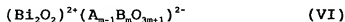
15. The coating solution for use in forming Bi-based ferroelectric thin films according to claim 13, which is stabilized with at least one stabilizer selected from among carboxylic
10 anhydrides, dicarboxylic acid monoesters, β -diketones and glycols.

16. The coating solution for use in forming Bi-based ferroelectric thin films according to any one of claims 1, 4, 7, 10 and 13, wherein said organometallic compound comprises a Bi
15 alkoxide, a metal A alkoxide, where A is at least one metallic element selected from among Bi, Pb, Ba, Sr, Ca, Na, K and a rare earth metallic element, and a metal B alkoxide, where B is at least one metallic element selected from among Ti, Nb, Ta, W, Mo, Fe, Co and Cr.

20 17. The coating solution for use in forming Bi-based ferroelectric thin films according to any one of claims 1, 4, 7, 10 and 13, wherein said organometallic compound comprises a Bi alkoxide, a metal A alkoxide, where A is at least one metallic element selected from among Bi, Pb, Ba, Sr, Ca, Na, K and a rare earth metallic
25 element, and a metal B alkoxide, where B is at least one metallic element selected from among Ti, Nb, Ta, W, Mo, Fe, Co and Cr, as well as at least two dissimilar metal alkoxides selected from among the metal A alkoxide, metal B alkoxide and Bi alkoxide form a

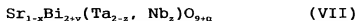
composite metal alkoxide.

18. The coating solution for use in forming Bi-based ferroelectric thin films according to any one of claims 1, 4, 7, 10 and 13, which is intended to form thin films containing Bi-layered structure compounds represented by the following general formula (VI):



- where A is at least one metallic element selected from among Bi, Pb, Ba, Sr, Ca, Na, K and a rare earth metallic element; B is at least one metallic element selected from among Ti, Nb, Ta, W, Mo, Fe, Co and Cr; and m is an integer of 1 - 5.

19. The coating solution for use in forming Bi-based ferroelectric thin films according to any one of claims 1, 4, 7, 10 and 13, which is intended to form thin films containing Bi-layered structure compounds represented by the following general formula (VII):



- 20 where $0 \leq x, y$ and α , independently < 1 ; and $0 \leq z < 2$.

20. The coating solution for use in forming Bi-based ferroelectric thin films according to any one of claims 1, 4, 7, 10 and 13, which is intended to form thin films containing Bi-layered structure compounds represented by the following general formula (VIII):



where $0 \leq x, y$ and α , independently < 1 .

21. The coating solution for use in forming Bi-based ferroelectric thin films according to any one of claims 1, 4, 7, 10 and 13, which is converted to a sol-gel fluid by hydrolysis and partial polycondensation using water either alone or in combination
5 with a catalyst.

22. A method of forming Bi-based ferroelectric thin films which comprises applying one of the coating solutions of claim 1 onto a substrate, drying the applied coating solution,
10 and then performing a rapid heat treatment at a temperature rise rate of at least 10 °C/s to form a Bi-based ferroelectric thin film.